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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/531,918	03/21/2000	David Scott Taubman	10990265-1	7309

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EXAMINER	
CHEN, WENPENG	
ART UNIT	**PAPER NUMBER**
2624	

DATE MAILED: 11/07/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/531,918	TAUBMAN ET AL.	
	Examiner	Art Unit	
	Wenpeng Chen	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *1-8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9,10,13-18,21-25 and 28* is/are rejected.

7)☒ Claim(s) *11-12, 19-20, 26-27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/20/2003 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

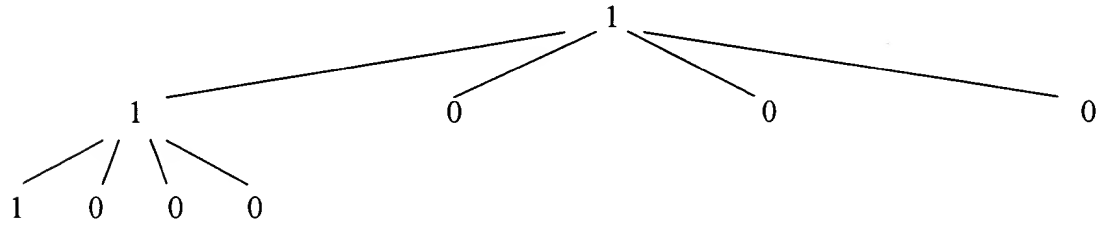
> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 9-10, 13-15, 17-18, 21-25, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Lei et al. (US patent 6,356,665 cited previously.)

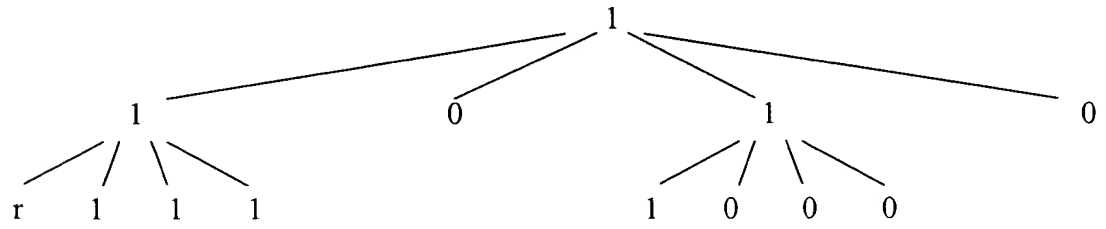
For Claims 9-10 and 13-15, Lei teaches a method for coding a set of numbers represented by a set of bit-planes having an arrangement between a highest and a lowest significance, comprising the step of:

-- generating a bit stream that describes a current one of the bit-planes in terms of a tree structure having a hierarchical arrangement of leaves such that the leaves of the tree structure are described in the bit stream in an order that is determined by an arrangement of zero values in a tree structure for the bit-plane having a next higher significance; (column 5, line 21 to column 6, line 65; Figs. 5, 6A, and 6B;

To demonstrate how Lei teaches this feature, let us take coding of the 2nd-significant-bit plane 96 in Fig. 6B as an example. As taught by Lei, the MSB plane 95 has a tree structure as shown below.



And the "2nd-significant-bit plane" 96 has a tree structure as shown below.



The bit stream that describes the "2nd-significant-bit plane" tree structure is shown in Fig. 6B. The bit stream is described in an order that is determined by an arrangement of zero values in the MSM plane 95 as explained below. The bit stream corresponding to the zeros at the left bottom depth in the MSB plane (the most left branch) r111 is written at first as r1s1s1s, wherein r is a refinement bit, s is sign bit, 1 and 0 are significance bits. Then the code corresponding to the insignificant branches in the MSB plane follows as 0,1,1s000,0. The whole bit sequence can be shown as r1s1s1s, 0,1,1s000,0. Evidently, the order of the bits of the "2nd-significant-bit plane" tree structure follows the arrangement of zero values in MSB plane of the tree structure. Similar argument is also applied between a pair of nth-bit plane and (n-1)th-bit plane.)

-- wherein the order decreases an amount of distortion reduction provided by the bit stream per bit of information in the bit stream; (column 2, lines 46-53; column 4, lines 14-49; column 6, line 65 to column 7, line 67; Figs. 5, 6A, 6B; When a block at a bit-plane level is decomposed into 4 subblocks at box 78 of Fig. 5, thus describing new branches and leaves of the tree. The passage in column 2, lines 46-53 indicates that coding process is an SNR scalable encoding.)

-- wherein the step of generating a bit stream comprises the step of generating a set of significance information in response to the tree structure for the current one of the bit-planes; (column 4, lines 36-48; column 5, line 60 to column 6, line 14)

-- wherein the step of generating a bit stream further comprises the step of concatenating a set of refinement information with the significance information; (column 4, lines 56-65; Figs. 6A and 6B; column 6, line 65 to column 7, line 67; The encoded bit streams are connected one

bit-plane after another bit-plane in the order from the MSB to LSB. The refinement information with the significance information are connected as shown in Fig. 6B. Bits r are connected to significance bits 1 and 0.)

-- wherein the refinement information follows the significance information in the bit stream. (As shown in Fig. 6B, the bit stream of a bit plane follows the bit stream of a next-higher bit plane. Therefore, some refinement information bits r follows the significance information 1 and 0 in the overall bit stream.)

Because Lei also teaches the apparatus corresponding to the above-discussed methods (Fig. 1), Lei also teaches the apparatuses of Claims 24-25 and 28.

For Claim 17, Lei further teaches in the system:

-- filter that generates a set of coefficients in response to an input image, the coefficients represented by a set of bit-planes having an arrangement between a highest and a lowest significance; (column 3, lines 45-63; column 5, line 21 to column 6, line 65; Figs. 5, 6A, and 6B; the above cited passages and explanation with regard to the method claims; Fig. 8; Fig. 8 clearly shows that sampling filters decompose the input image into four frequency subbands in each stage.),

-- encoder that generates a compressed image for the input image by generating a bit stream that describes each bit-plane in terms of a tree structure having a hierarchical arrangement of leaves such that the leaves of the tree structure are described in the bit stream in an order that is determined by an arrangement of zero values in a tree structure for the bit-plane having a next higher significance. (Fig. 1; column 2, lines 46-53; column 4, lines 14-49; column 6, line 65 to column 7, line 67; Figs. 5, 6A, 6B; column 4, lines 56-65; Figs. 6A and 6B; column 8, lines 53-

67; column 5, line 21 to column 6, line 65; Figs. 5, 6A, and 6B; the above cited passages and explanation with regard to the method claims)

For Claims 18 and 21-23, the above cited passages and explanation with regard to the method claims also teaches the claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lei as applied to Claim 15, and further in view of Wang (WO 00/10131.)

Lei teaches the parent Claim 15.

However, Lei does not teach that the refinement information follows the significance information and *precedes* a set of significance information for a next lower one of the bit-plane having a next lower significance.

Wang teaches an embedded quadtree coding in which the refinement information follows the significance information and *precedes* a set of significance information for a next lower one of the bit-plane having a next lower significance. (Fig. 9; page 8, lines 23-30)

As pointed out by Wang, refinement information and significance information can be arranged in any order. The order shown in Fig. 9 of Wang ensures high PSNR.

It is desirable to have high PSNR. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to arrange Lei's refinement information and significance information according to the order shown in Wang's Fig. 9 because the combination improves PSNR.

Allowable Subject Matter

6. Claims 11-12, 19-20, and 26-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter. The prior art fails to teach the method of Claim 11, the system of Claim 19, and the apparatus of Claim 26 which specifically comprise the following feature in combination with other recited limitations:

-- generating the bit stream such that *each leaf in* ***a maximum depth*** of the tree structure for the current one of the bit-planes that *corresponds to a leaf having a zero value* in the tree structure *for* the bit-plane having *the next higher significance is described* in the bit stream ***before*** *the leaves* of the tree structure *for the current one of the bit-planes that do not have a corresponding leaf* in the tree structure *for the bit-plane having the next higher significance.*

Lei does not teach this feature.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Primary Examiner
Art Unit 2624

November 3, 2003